

ABSTRACT OF THE DISCLOSURE**CAPACITIVE SENSING SCHEME FOR DIGITAL CONTROL STATE
DETECTION IN OPTICAL SWITCHES**

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Disclosed is an apparatus and method for detecting whether rotatable MEMS elements are in the "on" or "off" position. Embodiments of the invention have application in devices switches that employ mirrors that move between an "on" or "off" position, wherein they reflect light from an input fiber into an output fiber in the "on" position, and allow the light to pass in the "off" position. Electrodes are positioned in the device such that the mirrors are close to, and therefor capacitively coupled to, a different electrode depending on whether they are in the "on" or "off" position. This invention is especially useful for switches that already employ electrodes for electrostatic clamping of mirrors in one or more positions, since those same electrodes can be used both to electrostatically clamp the mirrors and to sense their position. The method described in this invention comprises sensing of the capacitance between the mirrors and the one or more electrodes used to clamp the mirrors in its one or more positions in order to detect which of the positions the mirrors are clamped in. Furthermore, the magnitude of the capacitances can be monitored to detect improper clamping.

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